



# EUSO MEETING

## Electronic reflections

Jean Pierre Mendiburu

LAPP, 3 October 2001

# Remember of Standard event Numbers

- Background : limit low energy precision
  - 450 photons/m<sup>-2</sup>/sr<sup>-1</sup>/ns<sup>-1</sup> =>7  $\gamma$ /cell/ $\mu$ s
  - =>0.7 photoelectrons /cell/ $\mu$ s (we take 1)
- Signal : energy, particle recognition
  - few tenth of photoelectrons /  $\mu$ s
  - Spay in time =< ( direction)
- Cherenkov : depth of shower + energy
  - Number of photoelectrons depends drastically on reflection
  - Time spray : between 0 and a few  $\mu$ s
-

# Electronic

- Preamp and MAPM's
  - Speed = Limit for high energy precision
  - Threshold : WHICH GRANULARITY ?
- Discriminators
- Threshold : WHICH GRANULARITY ?
- Remarks on gate width

# Trigger

- Tagged Cell
  - => discriminator => *LAM + CELL WORD*
- Track event signal
  - Circular memory ( 150 depth)
  - GTU-1, GTU-2, GTU-3
- Full event signal
- Treated by a DSP (one for the full experiment)

Table 2 : Trigger with 3 successive gates of 1  $\mu$ s

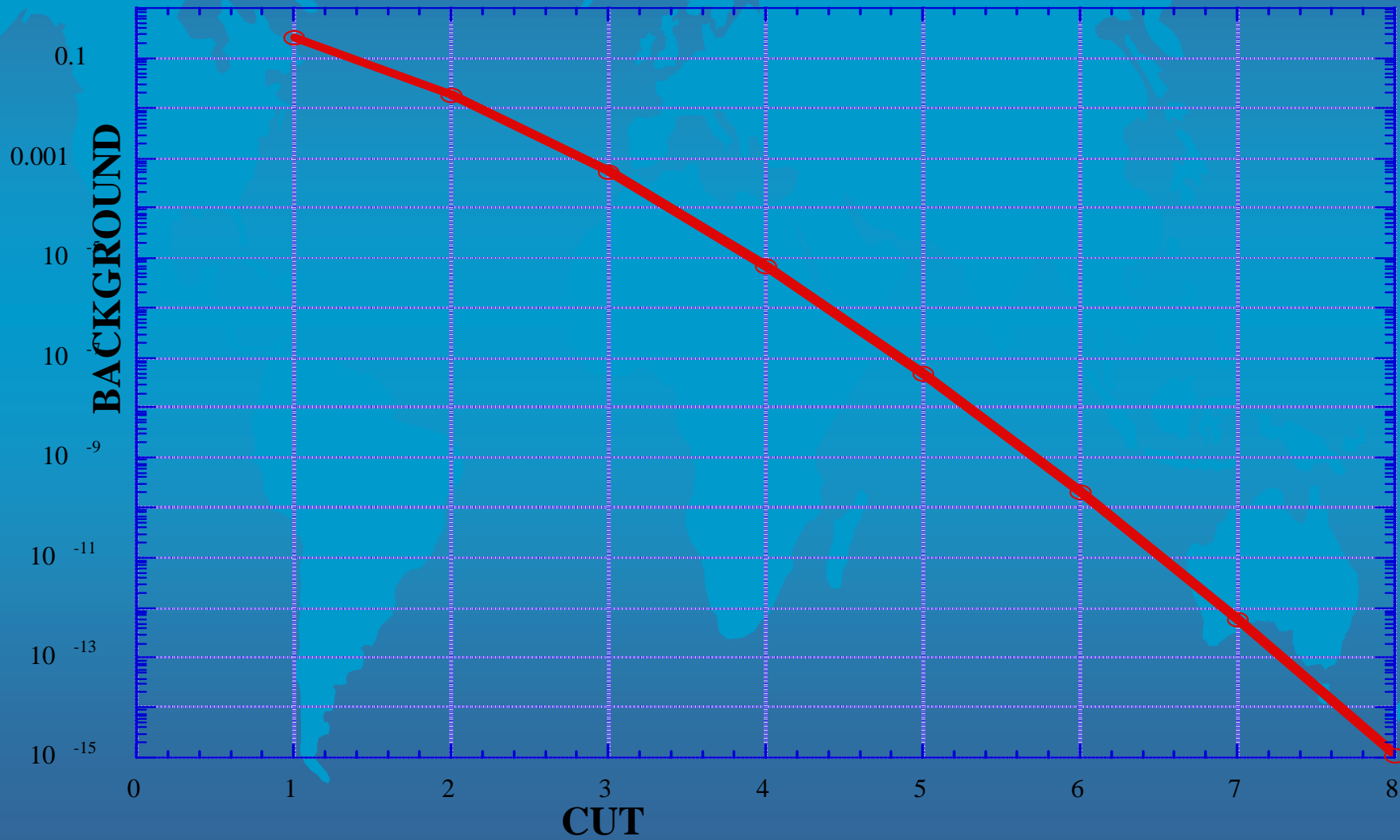
Probability to tag a cell (with a background of 1 photoelectron/ $\mu$ s) if we cut at 1,2,3,4,5 photoelectrons and efficiency for a signal of 1, 2, 3, 4, 5, 6, photoelectrons.

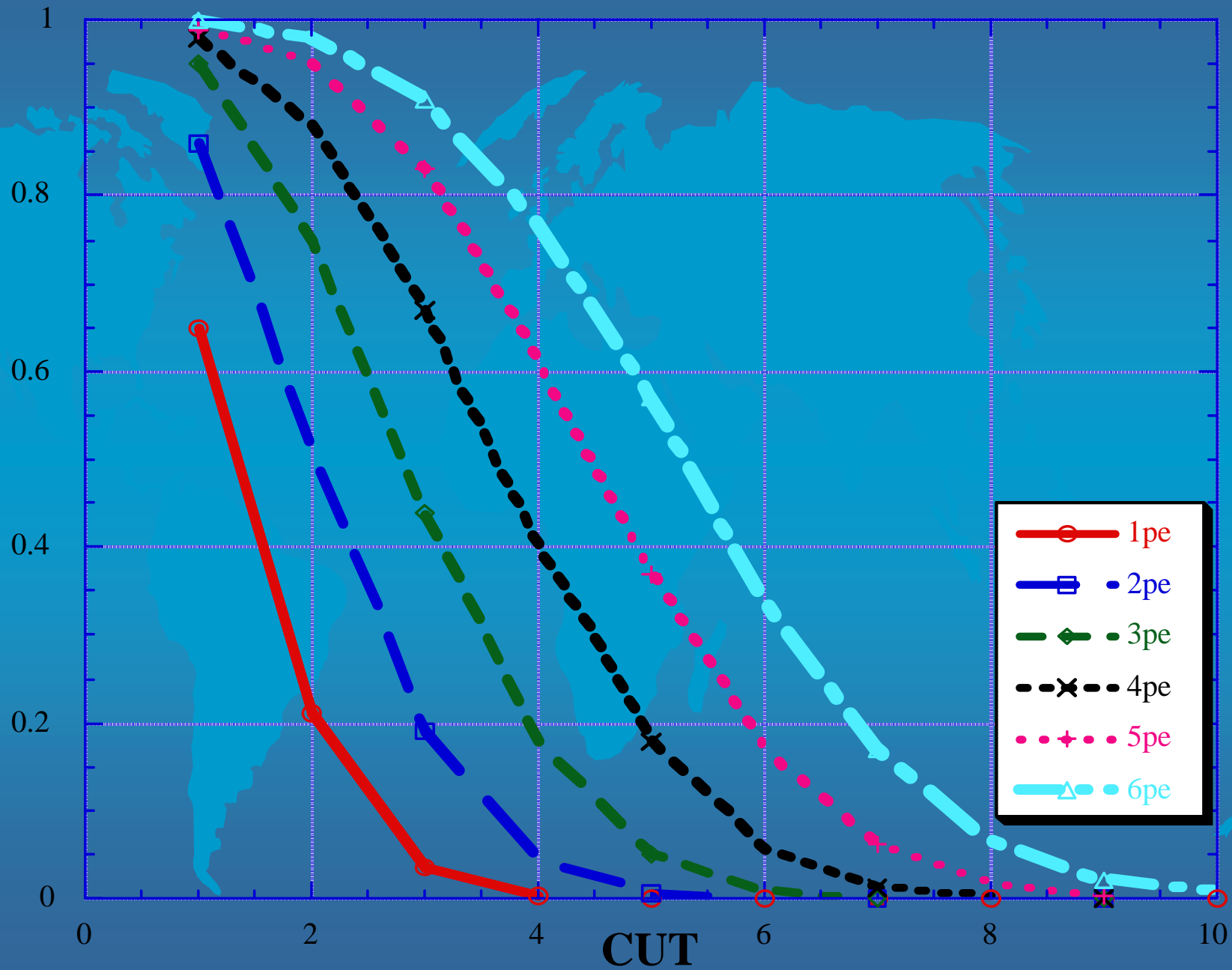
CUT	Leak (Bkg)	Signal 1 Pe	Signal 2 Pe	Signal 3 Pe	Signal 4 Pe	Signal 5 Pe	Signal 6 Pe
1	0.25	0.65	0.86	0.95	0.98	0.99	1
2	0.018	0.21	0.51	0.75	0.88	0.95	0.98
<b>3</b>	<b>0.00052</b>	<b>0.034</b>	<b>0.19</b>	<b>0.44</b>	<b>0.67</b>	<b>0.83</b>	<b>0.91</b>
4	6.8e-06	0.0029	0.044	0.18	0.4	0.61	0.77
5	4.9e-08	0.00015	0.0063	0.051	0.18	0.37	0.57

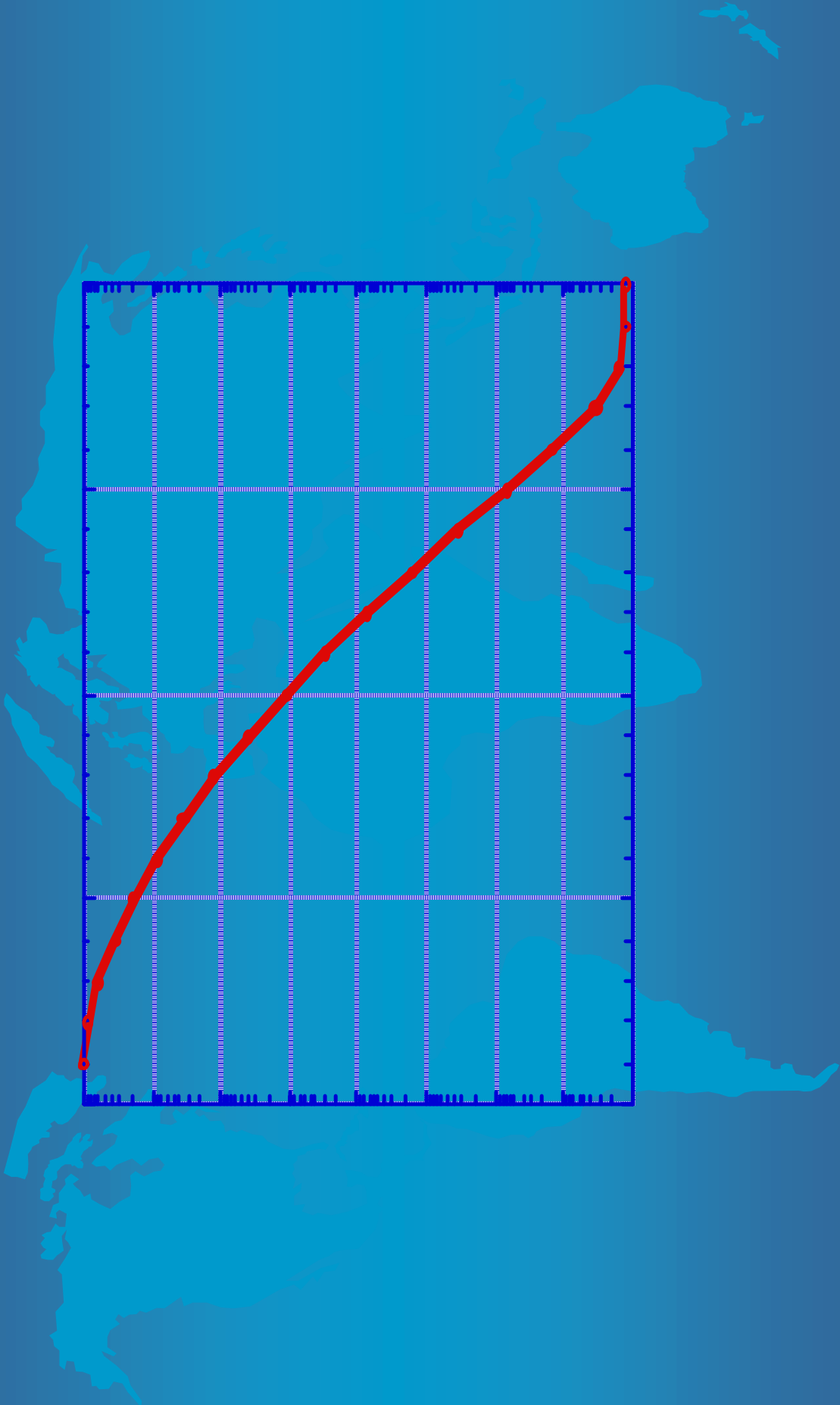
Table 3 : Trigger with a 3  $\mu$ s gate

Probability to tag a cell (with a background of 1 photoelectron/ $\mu$ s) if we cut at 1,2,3,...15 photoelectrons and efficiency for a signal of 3,6,9,12,15,18 photoelectrons / 3  $\mu$ s.

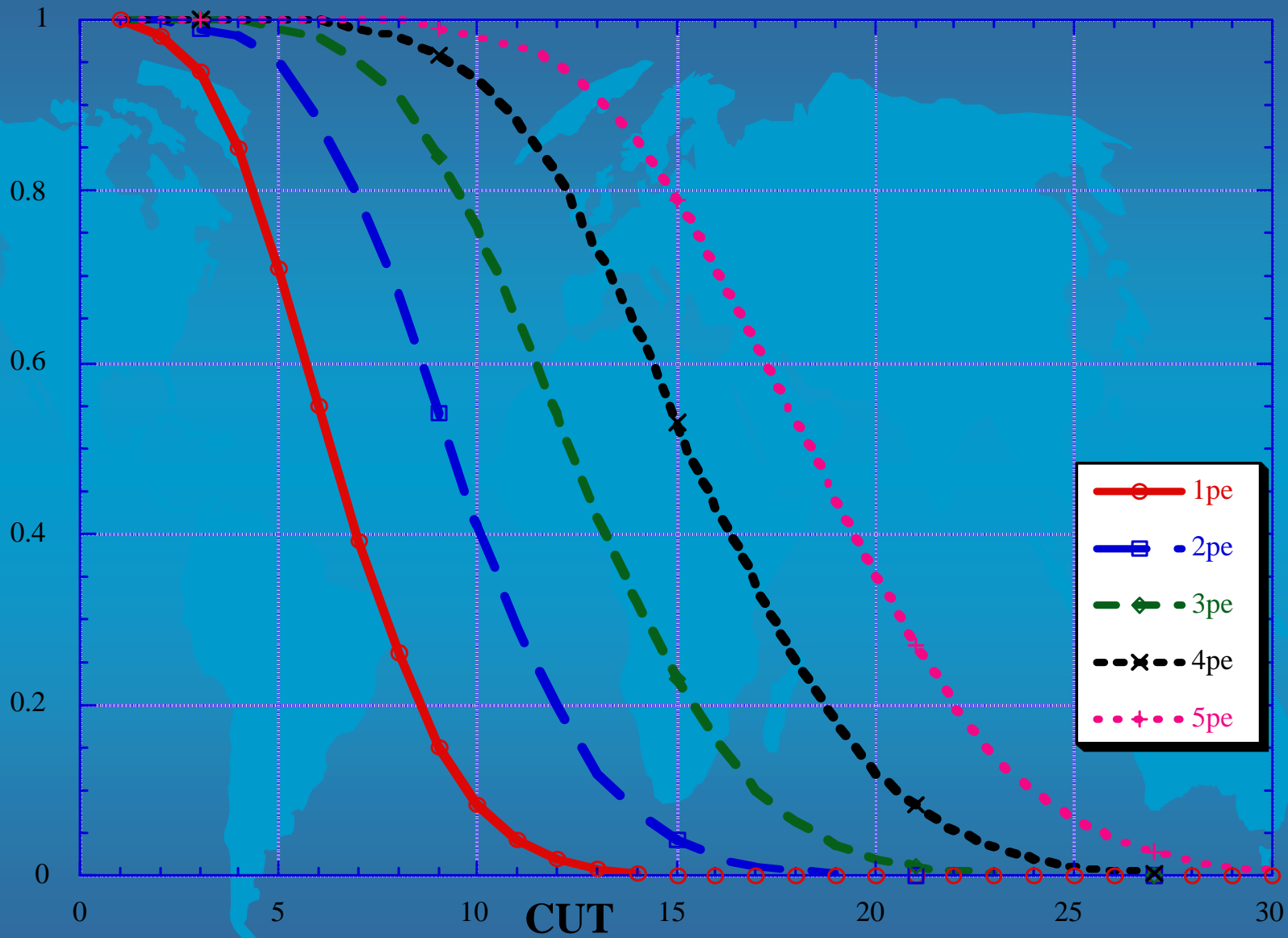
Cut	Leak (Bkg)	Signal 3 Pe	Signal 6 Pe	Signal 9 Pe	Signal 12 Pe	Signal 15 Pe	Signal 18 Pe
1	0.95	1	1	1	1	1	1
2	0.8	0.98	1	1	1	1	1
3	0.58	0.94	0.99	1	1	1	1
4	0.35	0.85	0.98	1	1	1	1
5	0.18	0.71	0.95	0.99	1	1	1
6	0.084	0.55	0.88	0.98	1	1	1
7	0.034	0.39	0.79	0.95	0.99	1	1
8	0.012	0.26	0.68	0.91	0.98	1	1
9	0.0038	0.15	0.54	0.84	0.96	0.99	1
10	0.0011	0.084	0.41	0.76	0.93	0.98	1
<b>11</b>	<b>0.00029</b>	<b>0.043</b>	<b>0.29</b>	<b>0.65</b>	<b>0.88</b>	<b>0.97</b>	<b>0.99</b>
12	7.1e-05	0.02	0.2	0.54	0.82	0.95	0.99
13	1.6e-05	0.0088	0.12	0.42	0.73	0.91	0.98
14	3.4e-06	0.0036	0.074	0.32	0.64	0.86	0.96
15	6.8e-07	0.0014	0.041	0.23	0.53	0.79	0.93











# Actual activity

- Need of implicated groups organisation
  - Palerme ( pioneer, reflection on trigger)
  - Gene (front end,  $\mu$  electronic)
  - Grenoble (with a  $\mu$  electronic group)
  - LAPP ( implied in reflection,  $\mu$  electronic group)
- A specific meeting this night at 6 PM